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CI/SfB
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Agrément Certificate No 04/4156

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

EUROCELL CONSERVATORY ROOF SYSTEMS

Système de serre
Gewächshaussystem

Product

- *THIS CERTIFICATE RELATES TO EUROCELL CONSERVATORY ROOF SYSTEMS.*
- *The roof systems are for conservatories used as extensions to new or existing buildings where an external grade door separates conservatory from inner room.*
- *It is essential that the roofs are installed and used in accordance with the conditions set out in the* Design Data *and* Installation *parts of these Front Sheets and accompanying Detail Sheets.*

Regulations — Detail Sheet 1

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément that the extension of a building by the addition at ground level of a conservatory, where the floor area does not exceed 30 m², is exempt from the Building Regulations.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

A conservatory forming a single-storey extension to an existing dwelling of purpose sub-group 1B or 1C, where the conservatory does not contain a flue or heat-producing appliance, is not within one metre of a boundary and the floor area does not exceed 8 m², is exempt from these Regulations. For conservatories with floor areas between 8 m² and 30 m² the following is applicable:

Regulation:	22	Conservation of fuel and power
Standard:	J7.1	Conservatories
Comment:		Glazing (including frames) for conservatories above 8 m² but under 30 m² may have a U value not more than 3.3 $Wm^{-2}K^{-1}$. See the tinted area in the *Condensation risk and thermal insulation* section of the accompanying Detail Sheets.

3 The Building Regulations (Northern Ireland) 2000

A conservatory constructed as an annexe to an existing building and having a floor area not exceeding 30 m^2 and not less than one metre from any boundary is exempt from these Regulations provided that the conditions described in A5 Exemptions are met.

4 Construction (Design and Management) Regulations 1994 (as amended)

Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: 2 *Delivery and site handling* (2.4 and 2.5) of the accompanying Detail Sheets.

Design Data

5 Strength and stability

5.1 The design of the Eurocell conservatory roof is based on BS 6399-2 : 1997, BS 6399-3 : 1988, CP 3 : V-2 : 1972, BS 8118-1 : 1991 and BS 8118-2 : 1991, and on comprehensive calculations prepared by a consulting engineer and verified by the BBA. Information required(1) to carry out a design includes:

- roof type
- site location (to evaluate wind and snow loads)
- glazing material
- span
- roof pitch.

(1) The data is used to establish the glazing bar profiles required and to decide whether tie bars are necessary.

5.2 Structural testing has been used to verify the relevant aspects of the manufacturer's design code.

5.3 The appropriate wind and snow loads should be calculated in accordance with the relevant part of BS 6399. The manufacturer's design covers snow loads of 0.6 kNm^{-2}, 0.75 kNm^{-2}, 0.8 kNm^{-2} and 1.0 kNm^{-2}. In all cases, it is assumed that the wind pressure will not exceed these snow loadings. These loads cover the majority of sites in the UK. Where wind loads are outside of this range the advice of the Certificate holder's technical department should be sought.

5.4 The basic acceptance criteria for the design are as follows:

- aluminium sections to BS 8118-1 : 1991
- deflection limited to span/175 for glazed roofs
- deflection limited to span/125 for polycarbonate or PVC-U roof.

5.5 It is assumed that the supporting structure will have adequate rigidity. This aspect is outside the scope of the Certificate.

5.6 Details of the connections between the roof, the existing structure and the conservatory walls are dependent upon their type and condition. Guidance is available from the Certificate holder or should be entrusted to a suitably qualified person.

6 Ventilation and solar heat gain

6.1 Outward opening casement or tilt and turn lights can be included in the wall frame option to provide natural ventilation. Opening roof vents can be included where required to provide greater levels of rapid ventilation, though these have not been assessed by the BBA. Additional background ventilation can be provided by the inclusion of trickle ventilators in the head of window and door units.

6.2 Ventilation of a habitable room may occur through an adjoining conservatory where both have ventilation openings with an overall area equal to or greater than that given in the appropriate supporting document to the relevant Building Regulations for the room.

6.3 Solar heat gain through the roof panels and wall frames may provide a useful additional heat input during winter conditions; however, summertime internal temperatures will also be raised. To limit the latter effect, the following design factors should be considered:

- orientation with respect to south
- aspect ratio of the floor plan of the conservatory
- area of opening lights and doors to area of floor expressed as a percentage.

6.4 As an approximate guide, northerly facing conservatories should have opening lights or doors of not less than 15% of the floor area, rising to not less than 25% with roof blinds for those of a southerly aspect. This should limit the solar gain temperature rise to less than 12°C for most situations in summertime, using only natural ventilation. Where lower temperature rises are desired, consideration can be given to mechanical forced ventilation. More precise methods of design

and solar data are given in *CIBSE (Chartered Institution of Building Services Engineers) Guide A* (1999), Section A4 and Appendix 5.A4.

6.5 To reduce the effects of solar heat gain on the internal temperature of the conservatory, blinds or coloured/heat-resistant glazing can be fitted but their performance has not been assessed by the BBA.

7 Security against intrusion

7.1 Glazing sheets are retained by glazing bar top cappings. Removal of glazing bar top cappings is extremely difficult.

7.2 It is recommended that a conservatory forming an extension to an existing dwelling should retain a lockable exterior type door to the main building.

8 Maintenance

8.1 The conservatory roof can be re-glazed and the gaskets replaced, but these operations should be carried out using the materials supplied by the Certificate holder and approved by the BBA.

8.2 The PVC-U internal and external claddings can be cleaned using water containing household detergent. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance. Abrasive cleaners should not be used, particularly on woodgrain finishes as the loss of the acrylic lacquer will have a serious effect on durability.

8.3 Care should be taken when using proprietary materials for cleaning the glazing to ensure that deposits are not allowed to remain on the PVC-U where they may cause discoloration and damage to the surface. In addition, care must be taken to avoid damage to, or discoloration of, the members when stripping paint from adjacent surfaces, for example, by means of a blowlamp, paint stripper or mechanical stripper.

8.4 Paints can adversely affect the impact strength of PVC-U cladding and the application of dark colours to white profiles could lead to a risk of thermal distortion. Therefore, painting of PVC-U is not recommended.

8.5 The roof panels can be replaced, if damaged, by removal of the glazing bar top capping. Cleaning should be carried out using water containing household detergent. To avoid scratching of the surface, only soft cloths should be used when cleaning.

8.6 Low pitch roofs are likely to require more frequent cleaning than those with a higher pitch; a greater pitch aids removal of dirt and debris by rainwater.

Installation

9 General

9.1 Design and manufacture of the conservatory roof systems is undertaken by the Certificate holder in accordance with the *Pinnacle Fabrication Manual*.

9.2 Cavity trays are required where the conservatory roof abuts the wall of the building for new construction and consideration is given to their inclusion in existing walls in exposed situations.

9.3 When the pitch of the building roof adjacent to the conservatory is steeper than 30° consideration should be given to the inclusion of snow guards. This will prevent the worst effects of snow slides and dropping debris.

10 Preparation

10.1 All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for imposed loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. Advice should be sought from the frame supplier for the specific use of members for the conservatory construction, with due consideration given to the recommended packings between glazing and framework.

10.2 Foundations must meet the requirements of BS 8004 : 1986, *NHBC Standard*, Chapter 4 : 1999 and Zurich Building Guarantees Technical Standards, Section 2, where applicable. Consideration should be taken of local conditions and advice sought from the local authority when necessary. If there are any doubts with regard to the stability of a site, a suitably qualified engineer should be consulted.

Bibliography

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*

BS 8004 : 1986 *Code of practice for foundations*

BS 8118-1 : 1991 *Structural use of aluminium — Code of practice for design*
BS 8118-2 : 1991 *Structural use of aluminium — Specification for materials, workmanship and protection*

CP 3 : 1972 *Code of basic data for the design of buildings — Chapter V-2 Loading — Wind loads*

Conditions of Certification

11 Conditions

11.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) is valid only within the UK;

(d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(e) is copyright of the BBA;

(f) is subject to English law.

11.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

(c) are reviewed by the BBA as and when it considers appropriate.

11.4 In granting this Certificate, the BBA is not responsible for:

(a) the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

(c) the actual works in which the product is installed, used and maintained, including the nature, design, methods and workmanship of such works.

11.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Eurocell Conservatory Roof Systems are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 04/4156 is accordingly awarded to Eurocell Profiles Ltd.

On behalf of the British Board of Agrément

Date of issue: 21st October 2004

Chief Executive

Associated Detail Sheets

The following Detail Sheets are part of this Certificate:

Detail Sheet	Edition	Date of issue	No of pages	Imprint ref	Title	System status
2	1	21st October 2004	8	01ECC2	The Eurocell Pinnacle Conservatory Roof System	Current
3	1	21st October 2004	4	01ECC3	The Eurocell Pinnacle 500 Low Pitch Lean-To Conservatory Roof System	Current

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For information about the Agrément Certificate, including validity and scope, tel: Hotline 01923 665400, or check the BBA website.

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TECHNICAL APPROVALS FOR CONSTRUCTION

DETAIL SHEET 2

Edition 1
No of pages 8

THE EUROCELL PINNACLE CONSERVATORY ROOF SYSTEM

Product

- *THIS DETAIL SHEET RELATES TO THE EUROCELL PINNACLE CONSERVATORY ROOF SYSTEM.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the system, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 The Eurocell Pinnacle Conservatory Roof System is designed and fabricated by Eurocell Profiles Ltd for use in the exposure conditions described in this Certificate.

1.2 The roof system is of aluminium construction with white or woodgrain PVC-U internal and external cladding available in the following configurations:

- Victorian/Edwardian/gable fronted style (duo pitched) with roof ptiches between 15° and 45° (see Figures 1, 2 and 3)
- Lean-to (mono pitched) style with roof pitches between 2.5° and 45° (see Figure 4)
- Combination P shape (duo and mono pitched combined) achieved through a variable angle valley section (see Figure 5).

1.3 Permissible size parameters and configurations are described in the *Pinnacle Fabrication Manual*. This Certificate relates to roofs used on conservatories not exceeding a floor area of 30 m^2 (8 m^2 in Scotland) within these parameters.

1.4 The full specifications and drawings for the materials and components covered by this Certificate have been examined and are retained by the BBA. This section gives only general details of the system. A complete schedule of the component parts is contained in the *Pinnacle Fabrication Manual* and the BBA technical file.

Figure 1 Victorian style conservatory roof

Figure 2 Edwardian style conservatory roof

Figure 3 Gable fronted conservatory roof

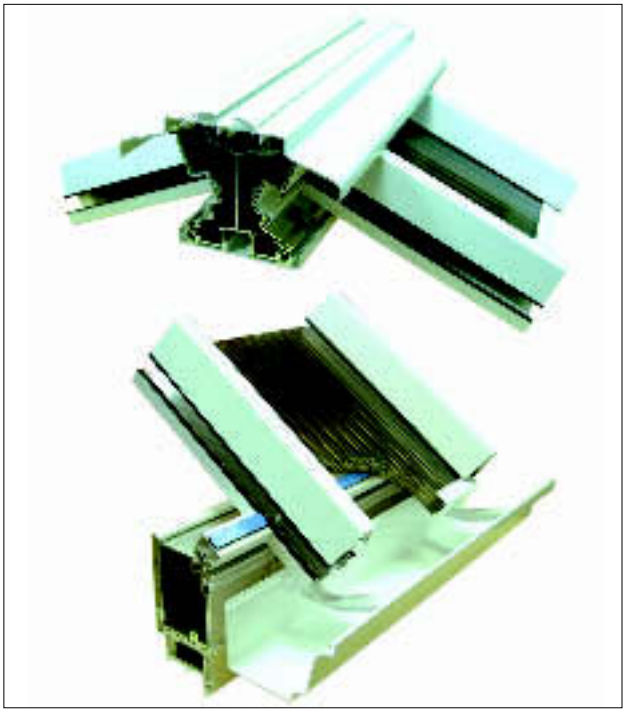
Figure 4 Lean-to style conservatory roof

Figure 5 Combination style conservatory roof

1.5 The roof system (see Figure 6) consists of a ridge beam member and glazing bar sections extruded from aluminium to BS EN 755-2 : 1997[1], material designation 6063-T6, glazed with three or five wall polycarbonate panels of either 16 mm, 25 mm or 32 mm thicknesses or 24 mm double-glazed sealed units that carry the BSI Kitemark to BS 5713 : 1979. An aluminium ring beam is attached to the supporting side wall structure with corner joints fixed with zinc-plated steel cleats. An aluminium variable support is located in the aluminium ring beam.

(1) Supersedes BS 1474 : 1987.

Figure 6 Cross-section through ridge and eaves beam



1.6 Glazing bars with PVC-U internal cladding and TPE co-extruded gaskets are attached to the ring beam and ridge using zinc-plated steel double and single studs (which slide into the dovetail section of the ridge and ring beam variable supports). Hip bars are fixed onto the zinc-plated steel spider bracket using spider bar mouldings (see Figure 7). Gable end glazing bars are attached to the ridge and ring beam in the same manner as the intermediate glazing bars. The gable-end glazing bars, where appropriate are fixed directly to the existing building wall to provide lateral stability in the roof structure, these incorporate the patented wall rafter gutter.

Figure 7 Spider bar assembly

1.7 Glazing panels or units supported by the glazing bars are located into the ridge system through a PVC-U glazing trim with a TPE co-extruded gasket, which provides a seal against the

ingress of moisture. External PVC-U caps with TPE co-extruded gaskets clip into position on the glazing bars and hold down the glazing panels or units, forming a seal between the internal and external gaskets.

1.8 To prevent ingress of moisture a patented closed-cell foam bung is used which is positioned on the spider bracket between the ridge and the hip bars (see Figure 8).

Figure 8 Foam bung assembly

1.9 External PVC-U ridge capping and radius end cappings are clipped/slid into position on top of the ridge body and are finished off with a cresting and finial. The internal side of the ridge is covered with a PVC-U bottom capping.

1.10 A PVC-U gutter system is attached to the PVC-U ring beam external trim around the full perimeter of the roof using twist in brackets.

1.11 The use of an integral gutter system can give quicker installation. The PVC-U extruded integral gutter clips onto the ring beam before it is positioned onto the supporting side wall structure.

1.12 A selection of tie bars may be fitted as required.

Quality Control

1.13 Quality control includes checks on all materials and components in particular:

- extruded aluminium profiles
- extruded PVC-U profiles
- other components.

1.14 Fabrication of the roof system includes visual inspection of:

- extruded aluminium profiles
- PVC-U profiles
- components
- and checks on overall dimensions.

2 Delivery and site handling

2.1 Conservatory roofs are prefabricated in the Certificate holder's factory. Components are marked and numbered to assist assembly. All components are suitably protected and delivered to site by the Certificate holder.

2.2 The conservatory roof has a label bearing the company's mark and the BBA identification mark incorporating the number of this Certificate.

2.3 The roof components should be stored under cover in a clean area and suitably protected to avoid distortion or damage.

2.4 The weight of glazing can be calculated, where required for manual handling operations, by reference to the information contained in BS 952-1 : 1995. The weight of the unglazed frame, and its ease of handling, particularly by one person, must also be taken into account when planning site operations.

2.5 When selecting means of access, for example, use of scaffolding, the safety of the operatives, the occupants, and the passers-by, during the period of installation, should be considered.

Design Data

3 Weathertightness

3.1 Selected samples from the Eurocell Pinnacle Conservatory Roof System configurations covered by this Certificate were tested for weathertightness. There are no standards or guides applicable to conservatory roofs. Therefore, for the assessment, use was made of BS 6375-1 : 1989 and MOAT No 1 : 1974 giving the results shown in Table 1. The gradings are based on the assumption that the conservatory is installed in accordance with the *Pinnacle Installation Guide*.

Table 1 Weathertightness

	BS 6375-1 Test pressure class (Pa)	MOAT No 1 Grading[1]
Watertightness		
Conservatory roof	300	E_3

(1) E_3 indicates no water leakage occurring at 300 Pa.

Note: A value for air permeability is not given as it will vary depending on the nature of the supporting walling structure.

3.2 To achieve the gradings given in Table 1, particular attention must be paid to the correct fitting of all gaskets and weatherseals, and to the detailing of sealants and flashings.

4 Behaviour in relation to fire

4.1 The tempered safety glass used can be regarded as a non-combustible material and therefore can be taken as having a Class 0 performance rating.

4.2 The polycarbonate sheet used in the conservatory roof has achieved a Class 1 rating when tested to BS 476-7 : 1997 and is therefore classed as a TP(a) rigid thermoplastic. In Table 18 of Approved Document B to the Building Regulations 2000 (as amended) (England and Wales) TP(a) rigid thermoplastics are allowed to be used in conservatory roofs.

4.3 The spread of flame across PVC-U is limited, and in a fire it will tend to char and may fall away. The use of the material in the construction of a conservatory roof would not accelerate the development of a fire.

5 Condensation risk and thermal insulation

In common with all glazed roof structures, temperature reduction under night-time winter sky radiation conditions will lead to the possibility of condensation. These effects may be minimised by the use of background heating to maintain the internal temperature between 3°C and 4°C above the external ambient temperature. The U values of the polycarbonate roof sheets and the central area of the double-glazed units, calculated according to BS 6993-1 : 1989, are given in Table 2. The linear thermal transmittance of the glazing rafters, eaves beam and ridge beam has been calculated as approximately 0.4, 1.0 and 1.0 $Wm^{-1}K^{-1}$ respectively, when incorporating the 25 mm polycarbonate sheeting. The internal surfaces of the ridge beam and ring beam adjacent to areas of glazing will have a similar risk of condensation to that of the glazing. Any occurrence of condensation will be slight and temporary provided the environment within the conservatory is maintained within the normal domestic banding of 10°C to 25°C and 40% to 65% RH, which may require the use of ventilation via a rooflight.

Table 2 U values of glazing

Type	Value ($Wm^{-2}K^{-1}$)
4/16/4 mm double-glazed units	3.1
16 mm triple-wall polycarbonate sheeting	2.6
25 mm five-wall polycarbonate sheeting	1.7
32 mm structured polycarbonate sheeting	1.6

6 Safety

Where a glass roof is specified, either sealed double-glazed units incorporating toughened safety glass Kitemarked to BS 6206 : 1981, or laminated glass, is used.

7 Supporting structure

All supporting side frames incorporating window profile material, ie PVC-U, timber or aluminium, should be designed in accordance with the relevant British Standards for imposed loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading.

8 Durability

8.1 Evidence is available on the performance in the UK of PVC-U similar to that used for the external and internal cladding, over a period of 15 years in windows and in excess of 20 years in other applications. Such evidence, when compared with the results of the tests on the conservatory roof, indicates that it will have a life of at least 25 years. Slight colour change or surface dulling may occur within the overall life of the roof.

8.2 Polycarbonate roof sheets, aluminium glazing bars and other components, will have similar durability. Where conservatory roofs are to be installed in areas subject to particularly aggressive conditions, for example, in coastal locations or near sources of industrial pollutants, replacement of components may be necessary within the life of the conservatory roof. Replacement of polycarbonate roof sheets and sealed double-glazed units may be necessary where prolonged exposure to direct sunlight causes degradation.

8.3 The gaskets and silicone sealant may need to be replaced within the life of the conservatory roof.

8.4 Solar heat gain will lead to higher surface temperatures for woodgrain finish roofs in comparison to the white finish. The actual external temperature reached will be dependent upon a number of factors including:

- orientation — south facing and 'sun-trap' locations with restricted air movement
- dark woodgrain finishes will reach a higher temperature than lighter shades
- shading by trees or other buildings.

8.5 In extreme cases, failure to consider these factors at the survey stage can lead to thermal distortion of capping profiles. For further guidance the Certificate holder should be contacted.

Installation

9 Procedure

9.1 The Eurocell Pinnacle Conservatory Roof System is supplied with detailed fitting instructions.

9.2 The ring beam (complete with integral gutter if being used) is positioned on top and in line with the supporting side frames and secured using the recommended fastener and fixing centres. The corner joints are spliced with steel cleats and fixing screws.

9.3 The ridge is placed in position and located with the gable end glazing bars, hip bars and transom bars. The hip bars with spider bar mouldings are fixed to the steel spider bracket (see Figure 7) and to the ring beam by single studs located in the dovetail section of the ring beam variable support. Gable end glazing bars and intermediate bars are attached to the ridge and ring beam sections by the single and double studs which locate in the dovetail section of the ridge and ring beam variable supports.

9.4 The gable end glazing bars are fixed directly to the existing house wall using appropriate fixings.

9.5 The roof is glazed with polycarbonate sheets or sealed double-glazed units. Each panel is located into the ridge system through a PVC-U glazing pocket with a co-extruded TPE gasket. External glazing caps with co-extruded TPE gaskets are clipped onto the glazing bars to form a seal against the glazing panel.

9.6 A closed-cell foam bung is used which is positioned on the spider bracket between the ridge and the hip bars. The PVC-U ridge and radius end cappings are clipped/slid into position.

9.7 Lead flashing is fitted at the abutment of the roof to the house wall and dressed into the wall rafter gutter of the gable rafter.

9.8 The installation is completed by fitting such items as trims, end caps, ridge cresting, finials, gutters and downpipes. Rainwater is directed to a soakaway or drain.

Technical Investigations

The following is a summary of the technical investigations carried out on the Eurocell Pinnacle Conservatory Roof System.

10 Tests

Tests were carried out to determine:

- watertightness (rain and wind)
- effect of wind loads
- effect of snow loads
- static load
- suitability of materials
- effects of heating due to solar radiation.

11 Investigations

11.1 The manufacturer's technical manual was examined for compliance with:

- BS 6399-2 : 1997
- BS 6399-3 : 1988
- BS 8118-1 : 1991.

11.2 Confirmatory calculations were carried out to verify section properties and glazing bar design charts.

11.3 Independent design calculations were carried out on typical roof designs to verify design methodology.

11.4 Computer predictions of structural performance were compared to those obtained from full-scale testing.

11.5 Site visits were conducted to establish the product's ease of installation and performance and durability in service.

Bibliography

BS 476-7 : 1997 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 952-1 : 1995 *Glass for glazing — Classification*

BS 1474 : 1987 *Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections*

BS 5713 : 1979 *Specification for hermetically sealed flat double glazing units*

BS 6206 : 1981 *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

BS 6375-1 : 1989 *Performance of windows — Classification for weathertightness (including guidance on selection and specification)*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*

BS 6993-1 : 1989 *Thermal and radiometric properties of glazing — Method for calculation of the steady state U-value (thermal transmittance)*

BS 8118-1 : 1991 *Structural use of aluminium — Code of practice for design*

BS EN 755-2 : 1997 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Mechanical properties*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of First edition: 21st October 2004

Chief Executive

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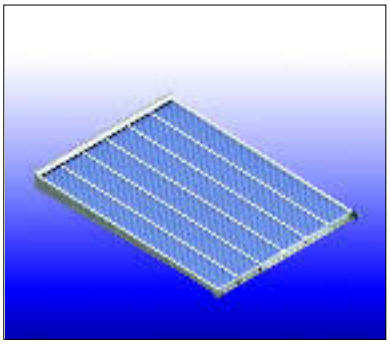
BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

DETAIL SHEET 3

Edition 1
No of pages 4

THE EUROCELL PINNACLE 500 LOW PITCH LEAN-TO CONSERVATORY ROOF SYSTEM

Product



• *THIS DETAIL SHEET RELATES TO THE EUROCELL PINNACLE 500 LOW PITCH LEAN-TO CONSERVATORY ROOF SYSTEM.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the system, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 The Eurocell Pinnacle 500 Low Pitch Lean-to Conservatory Roof System is designed and fabricated by Eurocell Profiles Ltd for use in the exposure conditions described in this Certificate.

1.2 The roof system is of aluminium and white PVC-U construction with PVC-U glazing panels. The 2.5° to 10° pitch roof is available as a lean-to configuration (see Figure 1).

Figure 1 Eurocell Pinnacle 500 Low Pitch Lean-to Conservatory Roof

1.3 This Certificate relates to roofs up to 3.5 m spans used anywhere in the UK and up to 4 m spans where the negative wind pressure does not exceed 0.75 kNm^{-2}. Within these parameters, the conservatory floor area must not exceed 30 m^2. Larger roof spans over 4 m (outside the scope of this Certificate) are possible but must be supported by a suitably designed purlin in accordance with relevant British Standards, according to the materials used. Design must include suitable fixing of reinforcing bars to purlin to prevent wind uplift. A qualified person should determine the size and specification of the purlin, advice can be sought from the Certificate holder.

1.4 The full specifications and drawings for the materials and components covered by this Certificate have been examined and are retained by the BBA. This section gives only general details of the system. A complete schedule of the component parts is contained in the *Pinnacle 500 Installation Guide* and the BBA technical file.

1.5 The roofing system (see Figures 2 and 3) consist of PVC-U stable glazing panels with a clear, flexible co-extruded PVC gasket. The roof system is complete with PVC-U eaves closure trim, 2.5° firrings and dedicated gutter kit.

Figure 2 Components of the Eurocell Pinnacle 500 Low Pitch Lean-to Conservatory Roof

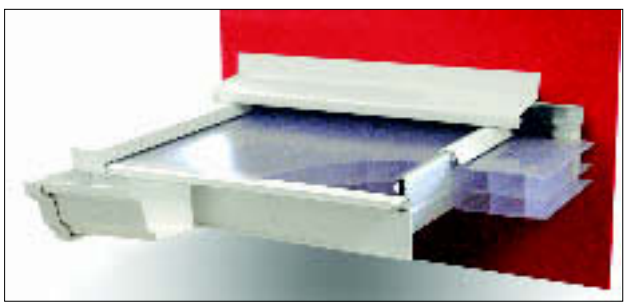
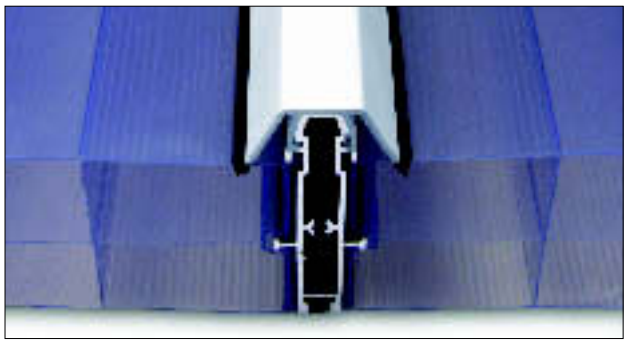


Figure 3 Section through the Eurocell Pinnacle Low Pitch Lean-to Conservatory Roof



1.6 The glazing panels are joined together by aluminium glazing bar sections extruded from aluminium to BS EN 755-2 : 1997[1], material designation 6063-T6, with PVC-U external claddings with TPE co-extruded gaskets.

(1) Supersedes BS 1474 : 1987.

1.7 The glazing panels are located and supported in an aluminium wall plate (which can be vented) which incorporates a PVC-U wall plate seal with co-extruded TPE gaskets. An external cladding trim and an internal cladding trim with TPE co-extruded gasket are also supplied.

1.8 The aluminium glazing bars are attached to the supporting wall frames using zinc-plated steel cleats and screws.

Quality control

1.9 Quality control includes checks on all materials and components, in particular:

- extruded aluminium profiles
- extruded PVC-U profiles
- other components.

1.10 Fabrication of the roof system includes visual inspection of:

- extruded aluminium profiles
- PVC-U profiles
- components
- and checks on overall dimensions.

2 Delivery and site handling

2.1 Conservatory roofs are fabricated in the Eurocell Profiles Ltd factory. All components are suitably protected and delivered to site by Eurocell Profiles Ltd.

2.2 The conservatory roof has a label bearing the company's mark and the BBA identification mark incorporating the number of this Certificate.

2.3 The roof components should be stored under cover in a clean area and suitably protected to avoid distortion or damage.

2.4 The weight of glazing can be calculated, where required for manual handling operations, by reference to the information contained in BS 952-1 : 1995. The weight of the unglazed frame, and its ease of handling, particularly by one person, must also be taken into account when planning site operations.

2.5 When selecting means of access, use of scaffolding and the safety of the operatives, occupants and passers-by during the period of installation should be considered.

Design Data

3 Weathertightness

3.1 A sample conservatory roof selected from the Eurocell Pinnacle 500 Low Pitch Lean-to range covered by this Certificate was tested for weathertightness. There are no standards or guides applicable to conservatory roofs. Therefore, for the assessment, use was made of BS 6375-1 : 1989 and MOAT No 1 : 1974 giving the results shown in Table 1. The gradings are based on the assumption that the conservatory is installed in accordance with the *Pinnacle 500 Installation Guide*.

Table 1 Weathertightness

	BS 6375-1 Test pressure class (Pa)	MOAT No 1 Grading[1]
Watertightness		
Conservatory roof	300	E_3

(1) E_3 indicates water leakage occurring between 300 Pa and 499 Pa.

Note: A value for air permeability is not given as it will vary depending on the nature of the supporting walling structure.

3.2 To achieve the gradings given in Table 1, particular attention must be paid to the correct fitting of all gaskets and weatherseals, and to the detailing of sealants and flashings.

4 Behaviour in relation to fire

4.1 The PVC panels used in the conservatory roof have achieved an EXT.F.AAX rating when tested to BS 476-3 : 1958.

4.2 The spread of flame across PVC-U is limited, and in a fire it will tend to char and may fall away. The use of the material in the construction of a conservatory roof would not accelerate the development of a fire.

5 Condensation risk and thermal insulation

In common with all glazed roof structures, temperature reduction under night-time winter sky radiation conditions will lead to the possibility of condensation. However, these effects may be minimised by ventilating the wall plate and by the use of background heating to maintain the internal temperature between 3°C and 4°C above the external ambient temperature. The U value of the multi-walled PVC-U roof sheet is calculated to be 1.7 $Wm^{-2}K^{-1}$ according to BS 6993-1 : 1989.

The frame heat losses of the glazing rafters have been calculated as approximately 0.3 $Wm^{-2}K^{-1}$ and their U values are therefore higher than those of the glazing. Consequently the rafters and the adjacent areas of glazing, will have a higher risk of condensation than the central area of glazing. Any occurrence of condensation will be slight and temporary provided the temperature and humidity within the conservatory are maintained within the normal domestic banding of 10°C to 25°C and 40% to 65% RH, which may require the use of ventilation via the rooflight.

6 Safety

If access to the roof is required for maintenance purposes, timber crawling boards must be placed across the roof panels.

7 Supporting structure

All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for imposed loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading.

8 Durability

8.1 Evidence is available on the performance in the UK of PVC-U similar to that used for the internal and external cladding, over a period of 15 years in windows and in excess of 20 years in other external applications. Such evidence, when compared with the results of tests on the conservatory roof, indicates that it will have a life of at least 25 years. Slight colour change or surface dulling may occur within the overall life of the roof.

8.2 Aluminium glazing bars and other components, will have similar durability. Where conservatory roofs are to be installed in areas subject to particularly aggressive conditions, for example, in coastal locations or near sources of industrial pollutants, replacement of components may be necessary within the life of the conservatory roof. Replacement of PVC-U roof sheets may be necessary where prolonged exposure to direct sunlight causes degradation.

8.3 The gaskets and silicone sealant may need to be replaced within the life of the conservatory roof.

Installation

9 Procedure

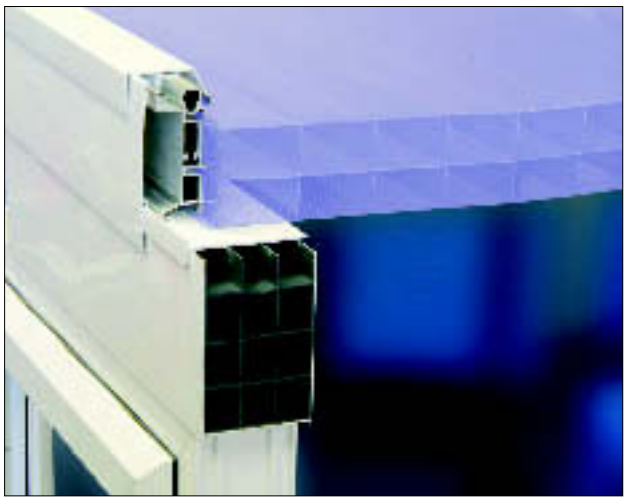
9.1 The Eurocell Pinnacle 500 Low Pitch Lean-to Conservatory Roof System is supplied with detailed fitting instructions.

9.2 The pre-cut 2.5° firrings are trimmed and fixed in position (see Figure 4).

9.3 The aluminium wall plate is notched and fitted to the wall using appropriate fasteners at the specified fixing centres. The PVC-U wall plate seal and foam seal are fitted.

9.4 The PVC-U gable end tray is positioned on the firring. The glazing panels are then laid in position between the aluminium wall plate and the front supporting wall structure. The aluminium glazing bars are then slid into position and are fixed as recommended.

Figure 4 Gable end detail



9.5 The PVC-U eaves closure trim is then fitted followed by the PVC-U gable end trims and external PVC-U glazing bar cappings with co-extruded TPE gaskets. The glazing bar cappings are clipped onto the glazing bars to form a seal against the glazing panel.

9.6 The internal PVC-U wall plate capping trim is clipped onto the aluminium wall plate followed by the external PVC-U wall plate capping trim complete with end caps. Lead flashing is then dressed over the abutment of the roof to the external wall.

9.7 Fitting the rafter end caps and gutter components completes the installation. Rainwater is directed to a suitable soakaway or drain.

Technical Investigations

The following is a summary of the technical investigations carried out on the Eurocell Pinnacle 500 Low Pitch Lean-to Conservatory Roof System.

10 Tests

Tests were carried out to determine:

- watertightness (rain and wind)
- effect of wind loads
- effect of snow loads
- static load
- suitability of materials
- effects of heating due to solar radiation.

11 Investigations

11.1 The manufacturer's technical manual was examined for compliance with:

- BS 6399-2 : 1997
- BS 6399-3 : 1988
- BS 8118-1 : 1991
- CP 3 : Chapter V-2 : 1972.

11.2 Confirmatory calculations were carried out to verify section properties and glazing bar design charts.

11.3 Independent design calculations were carried out on typical roof designs to verify design methodology.

11.4 Computer predictions of structural performance were compared to those obtained from full-scale testing.

11.5 Site visits were conducted to establish the product's ease of installation and performance and durability in service.

Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 952-1 : 1995 *Glass for glazing — Classification*

BS 1474 : 1987 *Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections*

BS 6375-1 : 1989 *Performance of windows — Classification for weathertightness (including guidance on selection and specification)*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*

BS 6993-1 : 1989 *Thermal and radiometric properties of glazing — Method for calculation of the steady state U-value (thermal transmittance)*

BS 8118-1 : 1991 *Structural use of aluminium — Code of practice for design*

BS EN 755-2 : 1997 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Mechanical properties*

CP 3 : 1972 *Code of basic data for the design of buildings — Chapter V-2 Loading — Wind loads*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of First edition: 21st October 2004

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